

Abstract

An electric arc welding torch having a central conductive contact tube for electrical contact between a power source and a welding wire moving through the contact tube toward a workpiece, a conductive sleeve concentric with the tube to define an annular chamber between the tube and the sleeve, a first dielectric barrier sleeve fixed on the conductive sleeve and a second dielectric sleeve on the tube where the dielectric sleeves are spaced from each other to define an annular gas passage extending around the moving wire and terminals to connect a high frequency power source between the tube and the conductive sleeve to create a dielectric barrier discharge plasma issuing from the gas passage. This torch is used in a novel welding method where the shielding gas envelope around the arc is a plasma.